



RAILROAD COMMISSION OF TEXAS

OFFICE OF GENERAL COUNSEL

RULE 37 CASE NO. 0271408
Status No. 719317
District 03

**APPLICATION OF SABCO OPERATING COMPANY FOR A RULE 37 EXCEPTION FOR
THE SABCO FOLTS LEASE, WELL NO. 5, LA BELLE, SW (6500) AND WILDCAT
FIELDS, JEFFERSON COUNTY, TEXAS**

APPEARANCES:

FOR APPLICANT:

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Edward C. McClintock
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APPLICANT:

Sabco Operating Company

FOR PROTESTANT:

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PROTESTANT:

Square Mile Energy, L.L.C.

PROPOSAL FOR DECISION

PROCEDURAL HISTORY

DATE APPLICATION FILED:	August 15, 2011
DATE OF NOTICE OF HEARING:	September 13, 2011
DATE OF INITIAL HEARING:	November 21, 2011
HEARD BY:	James M. Doherty, Hearings Examiner Richard Atkins, Technical Examiner
DATE WRITTEN CLOSING FILED:	December 20, 2011
DATE OF RE-OPENED HEARING:	February 28, 2012
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STATEMENT OF THE CASE

Sabco Operating Company (“Sabco”) requests a Rule 37 exception permit for its Sabco Folts Lease, Well No. 5, La Belle, SW (6500) and Wildcat Fields, Jefferson County, Texas. The well is proposed to be drilled as a vertical well on the western edge of Sabco’s 116-acre Folts Lease and will be the first well on the Folts Lease to be completed in the La Belle, SW (6500) Field.

The location of the proposed well is 33 feet from the west line and 400 feet from the south line of the Sabco Folts Lease and 1393 feet from the west line and 400 feet from the south line of the EL&RR RR Co./Spalding, C Survey, A-695, Jefferson County, Texas. Field rules for the La Belle, SW (6500) and Wildcat Fields provide for 467 foot lease line spacing. A Rule 37 exception is required for the Sabco Folts Lease, Well No. 5 because the surface location of the well is 33 feet from the west line of the lease. The application is opposed by Square Mile Energy, L.L.C. (“Square Mile”) which is the operator of the Catfish Lease offsetting the Sabco Folts Lease to the west. The La Belle, SW (6500) Field is currently a one well field. The only well in the field is the Catfish #1 operated by Square Mile.

The initial hearing in this docket was held on November 21, 2011. When Sabco filed its written closing argument, it requested the examiners to officially notice a July 9, 1943, Form 3 (Potential Test Form) filed by Sun Oil Company for the Folts Lease, Well No. 1 which described the location of the well as 626 feet from the south line and 3,133 feet from the west line of the Folts Lease. This Form 3 led Sabco to believe that the Sun Oil Company Folts #1 was not correctly spotted on Square Mile’s structure map, which Sabco thought was significant because of Square Mile’s reliance on this well for its contouring.

Because Square Mile objected to the taking of official notice of the Form 3 as proposed by Sabco, the examiners decided to reopen the hearing to address the relevance of the Sun Oil Company Folts #1 to the parties’ interpretations of the structure of the La Belle, SW (6500) Sand. The hearing was reopened pursuant to the legal examiner’s letter dated January 23, 2012, that stated the reopened hearing would be held for the limited purpose of allowing the parties to introduce additional evidence regarding how or whether the Sun Oil Company Folts #1 well should impact the parties’ interpretations of the structure of the La Belle, SW (6500) Sand.

Prior to the reopened hearing on February 28, 2012, the parties agreed to have the location of the Sun Oil Company Folts #1 surveyed by a registered professional land surveyor. The results of this survey were presented at the reopened hearing. The surveyed location of the well was found to be not materially different than the location shown on the Square Mile structure map presented at the initial hearing. As surveyed, the well is 240 feet from the south line of the Folts Lease.

DISCUSSION OF THE EVIDENCE

Sabco

Sabco's Folts Lease contains 116 acres. Square Mile's 88-acre Catfish Lease adjoins the Folts Lease on the west. The Catfish #1 on Square Mile's Catfish Lease was drilled directionally and is the only well in the La Belle, SW (6500) Field. Sabco proposes to drill the Sabco Folts Lease, Well No. 5 at a location 33 feet from the lease line that separates the Sabco Folts Lease and the Square Mile Catfish Lease, near the take point in the Catfish #1.

There are other wells on the Sabco Folts Lease drilled to the deeper Marg Sand, but the proposed Sabco Folts #5 will be the first well on this lease to be completed in the La Belle, SW (6500) Field. There are no "regular" locations on the Sabco Folts Lease where the Sabco Folts #5 would encounter the target reservoir. Appendix 1 to this proposal for decision is a copy of Sabco Exhibit No. 4, a plat showing the Sabco Folts and Catfish Leases, the location on the Catfish Lease of the Catfish #1, and the proposed location for the Sabco Folts #5 on the Sabco Folts Lease.

Appendix 1 also shows the location of the Sabco Folts #4 well. This well was drilled in August 2011. The well was drilled vertically through the La Belle, SW (6500) interval, then cased and drilled directionally to the Marg interval where the well is now producing. This well encountered the La Belle, SW (6500) Sand at a depth of -6510 feet. The point at which the Sabco Folts #4 encountered the La Belle, SW (6500) Sand is indicated by a small circle on Appendix 1 marked -6510', which is about 200 feet from the proposed location of the Sabco Folts #5. Information gained as a result of drilling the Sabco Folts #4 influenced the decision to drill the Sabco Folts #5 33 feet from the west line of the Sabco Folts Lease.

Appendix 2 to this proposal for decision is a copy of Sabco's Exhibit No. 36, a revised structure map of the La Belle, SW (6500) Sand structure presented by Sabco at the reopened hearing.¹ This structure map represents Sabco's interpretation of the structure of the La Belle, SW (6500) Sand beneath the Sabco Folts and Catfish Leases. Sabco's geologist described the reservoir as a three way dip structure trapped against a down to the north fault. The Sabco Folts Lease acreage position is on the eastern flank of the main structural feature, a south dipping structure. According to Sabco's geologist, the gas-oil contact is at -6513'. The original oil-water contact was at -6530', and the oil-water contact as of the logging of the Sabco Folts #4 in August 2011 was -6528'.

¹ In the vicinity of the proposed Sabco Folts #5, Sabco's revised structure map does not differ materially from the structure map presented at the initial hearing. The main difference in the two Sabco structure maps is that the structure map in Appendix 2 extends further to the east than did the structure map presented at the initial hearing. Sabco believes that the structure map presented at the initial hearing adequately addressed the subject La Belle, SW (6500) reservoir, but decided to extend the revised structure map to the east in order to match geographically Square Mile's structure map.

The Square Mile Catfish #1 well is completed at the crest of the La Belle, SW (6500) Sand structure. According to Sabco, the subsea top of the sand in the Catfish #1 is at -6495'. Sabco selected the proposed location for the Sabco Folts #5 on the basis of what it learned from the logging of the Sabco Folts #4. This additional information indicated that the structure of the La Belle, SW (6500) Sand was tighter than originally mapped by Sabco. The selection of the proposed location for the Sabco Folts #5 was influenced by Sabco's desire to position the well at the optimal location on the Sabco Folts Lease, up dip from where the Sabco Folts #4 encountered the 6500 foot sand.

The Sabco Folts #4 encountered the top of the La Belle, SW (6500) Sand at -6510'. This is 15 feet low to the Square Mile Catfish #1 that penetrated the top of the Sand at -6495'. According to Sabco's structural interpretation, the proposed Sabco Folts #5 will encounter the top of the 6500' Sand at approximately -6505'. This would be ten feet low to the Square Mile Catfish #1 well. Structure is important in making a producing well in this reservoir. This sand is a strong water drive sand with hydrocarbons trapped at the higher structural elevations. The higher a well encounters the structure, the more reserves the well will recover. Sabco believes that it needs to drill at the highest structural position on the Sabco Folts Lease in order to recover the reserves beneath the lease. Sabco expects to maximize recovery of oil reserves by locating the proposed Sabco Folts #5 slightly north and up dip from the Sabco Folts #4 that just barely penetrated the gas cap.

A location 467 feet from the west line and 467 feet from the south line of the Sabco Folts Lease would not be productive in the La Belle, SW (6500) Sand. Such a location would be downthrown to the boundary fault on the north or faulted out. According to Sabco's interpretation, a location closer than 467 feet to the south line but 467 feet from the west line would be in the reservoir but would be in a down dip position, between the -6520' and -6530' contours on Sabco's structure map. This would be very close to the oil-water contact at -6528'. According to Sabco's geologist, such a well might get 2 or 3 feet of oil.

At the initial hearing, Sabco's geologist presented a cross section consisting of logs for the Catfish #1, the Sabco Folts #4, and the Samedan Broussard B-1.² On the log for the Catfish #1, the top of the 6500' Sand is at -6494'. There is a discernible gas zone and oil zone in the Catfish #1. This well produced from perforations in the oil zone until November 2011, when Square Mile chose to recomplete the well with new perforations in the gas cap at the top of the 6500' Sand. Sabco used the log for the Catfish #1 to pick the original oil-water contact at -6530'. Pay in the 6500' Sand in the Catfish #1 seen on the log is 10 feet of gas and 15 feet of oil. The Sabco Folts #4 was logged on August 27, 2011. The top of the 6500' Sand in this well is at -6510', about 15 feet low to the Catfish

² A second cross-section was presented by Sabco at the reopened hearing consisting of logs for the Catfish #1, Folts #4, Folts #1, Folts #3 and Folts #2. This cross-section was used by Sabco's geologist to support her picks of the 6500' Sand in the referenced wells as compared to Square Mile's picks. Sabco's geologist thought that honoring the more accurate picks supported by the logs in this cross-section would have required changes in Square Mile's contouring and made Square Mile's structure map look more like Sabco's. Square Mile's geologist did not dispute the accuracy of the picks made by Sabco's geologist, but did not think the discrepancies in Square Mile's picks for wells distant from the location of the proposed Sabco Folts #5 had much relevance.

#1 well. The well had about 2 feet of gas at the very top of the sand. A gas-oil contact at about -6513' was picked from this log. Also, an oil-water contact at -6528' was picked from the log, indicating that the oil-water contact had moved up about two feet from that originally seen in the Catfish #1. Overall, pay in the 6500' Sand in the Sabco Folts #4 was about two feet of gas and about 12 feet of oil. The Samedan Broussard B-1 was included on the cross section because it is a down dip well. The original oil-water contact was slightly above the top of porosity in this well. The well was a dry hole in the 6500' Sand and was plugged and abandoned.

Sabco's geologist prepared net oil isopachs and net gas isopachs for the reservoir beneath the Sabco Folts Lease for use by Sabco's reservoir engineer in making reserve estimates. There are 308.1 acre feet of oil reservoir in the 6500' Sand and 137.5 acre feet of gas cap in the reservoir. There are 35.2 net acre feet of oil currently in place and 2.6249 acre feet of gas cap beneath the Sabco Folts Lease.

Before the Sabco Folts #4 was drilled, Sabco had a different structural interpretation of the La Belle, SW (6500) reservoir. At that time, Sabco believed that the reservoir extended further to the east and there was a location further to the east on the Sabco Folts Lease where the Sabco Folts #5 could be drilled such that the well would be only slightly down dip to the Catfish #1. This pre-Sabco Folts #4 location was similar to the alternative location for the Sabco Folts #5 now contended for by Square Mile. However, when Sabco drilled the Sabco Folts #4, it discovered that the originally planned location was structurally lower than Sabco had anticipated, that is, a well drilled at this location would encounter the La Belle, SW (6500) Sand at -6510' rather than -6500'. Sabco changed its structure map of the La Belle, SW (6500) Sand structure as a result of drilling the Sabco Folts #4.³

Square Mile's structure map shows the 6500' reservoir extending further east than does Sabco. Square Mile's structure map shows a secondary high structural feature to the east on the Sabco Folts Lease that Sabco does not interpret. According to Square Mile's interpretation, the Sabco Folts #5 would be faulted out at the location proposed by Sabco, and there is a location on the Sabco Folts Lease 467 feet from Square Mile's lease line where the Sabco Folts #5 could be drilled.

Sabco believes that the alternative location recommended by Square Mile would be down dip to the Sabco Folts #4 and would not be at the highest structural position on the Sabco Folts Lease, even as Square Mile maps the structure of the reservoir. Sabco's geologist disagreed with the interpretation shown on the Square Mile structure map because Sabco does not interpret a secondary high off to the southeast on the Sabco Folts Lease. Sabco does not believe that it would encounter significant reservoir at the location contended for by Square Mile. Sabco believes that the location

³ At the reopened hearing, Sabco's geophysicist explained that well control showed structure dipping to the east between the Catfish #1 and the Folts #4 even though the seismic signature was indicative of a structure building to the east. After the logging of the Folts #4, it became obvious to Sabco that the seismic was indicating a false or induced structure due to a velocity discrepancy in the shadow of the bounding fault.

proposed by Square Mile would not give Sabco an opportunity to recover the reserves beneath the Sabco Folts Lease because the location is down dip, and, furthermore, at this location Sabco would not see any portion of the gas cap and would have a lesser recovery of oil.

A Sabco reservoir engineer presented reserve estimates for the Sabco Folts Lease. Oil in place beneath the Sabco Folts Lease is 51,000 BO. Current recoverable oil beneath this lease is 33,366 BO. Gas in place beneath the lease is 5,427 MCF, and current recoverable gas is 3,528 MCF.

Sabco's reservoir engineer also presented production data for the Square Mile Catfish #1 well. Between January 2007 and August 2011, cumulative production for the Catfish #1 was 106,962 BO. The well produced through the original perforations through November 2011, at which time the well appeared to load up and die. Thereafter, Square Mile squeezed-off the old perforations in the well which were in the oil column and re-perforated the well at the top of the gas cap. The well was making 90% water when still perforated in the oil column. In October 2011, the well was making about 30 BOPD and 1,000 BWPD. Wells in this formation have experienced problems with the coning of water, which is a problem expected with respect to the Sabco Folts #5. Perforations in the Catfish #1 were ten feet above the oil-water contact when the well was completed in the oil zone. Even though the oil-water contact has moved up only two feet as shown by the logging of the Sabco Folts #4, the Catfish #1 has produced a lot of water because it is completed in a very permeable sand and fluids can flow through the sand vertically as well as laterally. On the log for the Catfish #1, 100 feet of aquifer below the oil leg can be seen, and this water moves vertically through the reservoir and is produced under the dynamics of flow.

Sabco's reservoir engineer believes that the Catfish #1, as now recompleted at the top of the gas cap, will continue to drain the Sabco Folts Lease. As gas is produced from the gas cap and liquids fill in the void, more oil will move up into the gas cap, mostly off the Sabco Folts Lease. Drainage of the Sabco Folts Lease by the Catfish #1 has already occurred. Originally, the Sabco Folts Lease had 39.7 MBO of recoverable oil, whereas on the date the Sabco Folts #4 was logged, the lease had 33.4 MBO recoverable. Sabco's reservoir engineer estimated that the Catfish #1 has drained about 6,000 BO from the Sabco Folts Lease.

Sabco's reservoir engineer also gave testimony regarding water influx in the Sabco Folts #5 if the well were drilled at the location recommended by Square Mile. This well might have a five foot oil column, and at that point the well would have a coning problem. It has been Sabco's experience with other La Belle wells that where the well has only 3 to 5 feet of oil and just the top two feet are perforated, water breaks through within about one week. Sabco needs to place the proposed well at the highest structural position possible so that the well can produce enough oil before it begins to cone up water. Eventually, the water volume becomes too high and it becomes uneconomic to produce the well. The location proposed by Sabco for the Sabco Folts #5 is the highest structural position on the Sabco Folts Lease.

A senior geophysicist for Sabco testified that Sabco had a 3-D seismic survey over the entire La Belle, SW (6500) Field area. At the initial hearing, he presented four arbitrary seismic lines from the 3-D seismic data across the area of the Catfish and Sabco Folts leases and drew certain conclusions from the seismic. Moving north from the Sabco Folts #4 location, structure is gained in the La Belle, SW (6500) Sand. The proposed Sabco Folts #5 location is upthrown to the trapping fault and in the same reservoir with the Catfish #1. According to the Sabco geophysicist's interpretation of the seismic lines, to the east and southeast on the Sabco Folts Lease there is no secondary satellite structure; the structure just dips off to the southeast. To gain the most structural position on Sabco's acreage, it is necessary to move as far north and as close to the fault as is prudent without crossing the fault.

Based on analysis of the seismic data, it is the opinion of Sabco's geophysicist that Square Mile's interpretation that the proposed location for the Sabco Folts #5 is faulted out is not correct, and the secondary structural high off to the east on the Sabco Folts Lease interpreted by Square Mile does not exist. The C to C' seismic line in Sabco Exhibit No. 31 runs parallel to the upthrown side of the fault in a southeast direction and shows no evidence that there is a secondary closed high to the southeast. The structure simply continues to dip off to the southeast.

Sabco's geophysicist presented additional seismic lines at the reopened hearing to define the extent of the bounding fault. These seismic lines show that the fault dies out to the west of the Sun Oil Company Folts No. 1. No fault cut is seen in the log for this well.

Square Mile

Square Mile earned the 88 acres in the Catfish Lease by drilling a well under a farm out arrangement with Sabco. The La Belle, SW (6500) Field was discovered on January 20, 2007. The Square Mile Catfish #1 well is the only well in the field, and no other well has ever produced from the field. Square Mile's interpretation is that the top of the La Belle, SW (6500) Sand in the Catfish #1 is at -6493' which is only two feet different from Sabco's interpretation. The Catfish #1 was drilled as a directional well to optimize following along the upthrown side of the fault with the wellbore, staying high and near the fault and to improve the chances of having stacked pays in the wellbore.

Square Mile believes that the seismic data acts as a good representation of the structure in this area. A structural cross section was presented by Square Mile's geologist to show what the stratigraphic section looks like as to the distribution of shales and sands and to illustrate the structural trap which all agree is an upthrown closure against a down to the north fault. Square Mile agrees that the gas-oil contact is at -6509' and the Catfish #1 has an oil column of about 20 feet below the gas oil contact. There is about 30 feet of gas column in the Catfish #1.

Appendix 3 to this proposal for decision is a copy of Square Mile Exhibit No. 8, Square Mile's structure map of the La Belle, SW (6500) Sand structure.⁴ This structure map honors the seismic data away from wellbores and contours on the structure map are fit to honor tops in wellbores. The gas-oil contact is mapped at -6509' and the oil-water contact is mapped at -6530'. Square Mile's mapping of the structure is influenced by the Sun Oil Company Folts #1 which is downthrown to the trapping fault. Square Mile believes the fault is dying out, but is nonetheless present, in the area of this well. If it is assumed that there is only 15 feet of throw in the area around the Sun Oil Company Folts #1, which, according to Square Mile's pick, has a top in the 6500 Sand at -6535', the upthrown point on the south side of the fault has to be around -6520'. If the -6522' top in the Samedan Oil Corp. 1B well is honored, and the -6520' contour is run to honor the -6510' top in the Sabco Folts #4, the contour must trend to the east and terminate somewhere close to the Sun Oil Company Folts #1 well. This pulls the -6520' contour east and is the reason Square Mile has mapped the structure in the way it has on Appendix 3.⁵

Appendix 3 shows a possible alternative location for the proposed Sabco Folts #5 that is 467 feet from Square Mile's lease line. Square Mile's geologist believes that the available seismic data shows this location is basically flat to the Sabco Folts #4 (-6510'). Square Mile's geologist also believes that if Sabco wanted to be aggressive, it could probably move the location recommended by Square Mile 200' to the north, toward the fault. This would be moving to a structurally high position, and a well drilled there would be in the gas cap. Square Mile's geologist believes that placing the Sabco Folts #5 at the location proposed by Sabco runs the risk of hitting the fault.

Square Mile's geologist agreed that there is no regular location on the Sabco Folts Lease where the Sabco Folts #5 might be drilled to encounter the target reservoir. As long as Sabco stays 467 feet off Square Mile's lease line, Square Mile does not object to any other Rule 37 Sabco may need to drill the well.

Square Mile's geologist presented Square Mile Exhibit No. 9, an arbitrary seismic line B to B' in the 6500' Sand running southwest to northeast along the path of the Catfish #1 to the Catfish #1 take point and then east through Sabco's proposed location for the Sabco Folts #5, the Sabco Folts #4, and Square Mile's recommended location for the Sabco Folts #5. According to Square Mile's interpretation, as there is movement north along this seismic line, there is obvious dip to the south. However, as there is movement east beginning at the Catfish #1 take point, the structure is basically flat all the way to Square Mile's recommended location for the Sabco Folts #5.

⁴ This same structure map, with minor annotations as to the surveyed location of the Sun Oil Company Folts #1 and the location of a C to C' seismic line, was presented by Square Mile at the reopened hearing as Square Mile Exhibit No. 24.

⁵ Square Mile's geologist conceded that the fault is difficult to pick from a C to C' seismic line that extends through the Sun Oil Company Folts #1, and he could not "pound the table" as to the extent of the fault.

Square Mile's geologist believes that the Sabco Exhibit No. 31 C to C' seismic line sponsored by Sabco's geophysicist is very similar to the Square Mile Exhibit No. 9 B to B' seismic line. As Square Mile's geologist interprets Sabco Exhibit No. 31, there is very little loss of structure between Square Mile's lease line and the 467 foot location recommended by Square Mile for the Sabco Folts #5, perhaps two milliseconds which would be about 8 feet.

According to Square Mile's geologist, the highest point on the Sabco Folts Lease where Sabco might drill the Sabco Folts #5 is due north of the 467 foot location recommended by Square Mile. This location would be low to the Catfish #1, but, according to Square Mile's interpretation, would be higher than the location proposed by Sabco for the Sabco Folts #5 by two or three feet.

Square Mile agrees with Sabco that this is a water drive reservoir and that a well with the take point highest on structure will maximize recovery. As the well is produced, the water level gradually increases, and the higher the well is structurally, the more oil or gas production is prolonged. Square Mile believes that its recommended location for the Sabco Folts #5 is a reasonable location because, according to Square Mile's interpretation, it is just as high on structure as is Sabco's proposed location for the well. It is Square Mile's interpretation that both of these locations will encounter the 6500' Sand at -6510'.

A structure map prepared by Square Mile's geologist, representing his interpretation of the La Belle, SW (6500) Sand structure prior to the time when the Sabco Folts #4 log was provided to Square Mile shortly before the initial hearing, mapped a large portion of the Sabco Folts Lease significantly high to the Catfish #1 which encountered the 6500' Sand at -6493'.

Square Mile's President and CEO, who is also a petroleum engineer, presented testimony regarding reserve estimates and production by the Catfish #1. Through November 2011, the Catfish #1 had cumulative production of 109,000 BO and 179 MMCF of gas. Based on a recent rework of the well, Square Mile projects remaining oil reserves for the well of about 55,000 BO and an estimated ultimate recovery of 164,000 BO.

Water production increased dramatically during the first year of production of the Catfish #1 and then continued to increase at a lesser rate up to the time the well was reworked in October-November 2011. The rework resulted in an increase in oil and gas production and a decrease in water production.

Original oil in place in the subject reservoir was about 460,000 BO. Original gas in place in the gas cap was about 168 MMCF. Square Mile projects that about 80% of the original gas in place in the gas cap, or about 135 MMCF, will be recovered. Square Mile projects a recovery factor of 35.6% for the oil zone in the reservoir based on its calculation of original oil in place and an EUR for the Catfish #1 of 164,000 BO. This recovery factor is believed to be more reasonable than the 65% recovery factor postulated by Sabco. Square Mile believes that in arriving at an estimated recovery factor, Sabco simply underestimated the original oil in place. Sixty-five percent is an unusually high recovery factor for a water drive reservoir in the Gulf Coast region.

The rework of the Catfish #1 was performed because the economics of the well were becoming marginal. In early to mid-October 2011, the Catfish #1 was making 30-35 BOPD and about 1,000 BWPD. At that point, the well loaded up and died. The workover was performed, and the well was turned back on in early November 2011. Within about two weeks the oil rate stabilized at 40-42 BOPD.

The initial perforations in the Catfish #1 were 10 feet above the oil-water contact, but by the time these perforations were abandoned in October 2011, the well was making 1,000 barrels of water per day. This was due to coning rather than a rise in the oil-water contact. Square Mile's President and CEO believes that the recovery of the proposed Sabco Folts #5 at the alternative 467 foot location recommended by Square Mile would not be substantially different from the recovery of the well if drilled at Sabco's proposed location.

EXAMINERS' OPINION

An owner of oil and gas is entitled to an opportunity to recover the reserves underlying his tract, and any denial of that opportunity amounts to confiscation. *Atlantic Refining Co. v. Railroad Commission*, 346 S.W.2d 801 (Tex. 1961); *Imperial American Resources Fund, Inc. v. Railroad Commission*, 557 S.W.2d 280 (Tex. 1977). When the subject tract is capable of supporting a regular location, the applicant for a Rule 37 exception based on confiscation must prove that the proposed irregular location is necessary because of surface or subsurface conditions and that the proposed location is reasonable. To do this, the applicant must show that it is not feasible to recover its fair share of hydrocarbons from regular locations.

The examiners are of the opinion that approval of the Rule 37 exception requested by Sabco is necessary to prevent confiscation. Both parties agree that there are reserves in the La Belle, SW (6500) Field beneath Sabco's Folts Lease and that the drilling of a well on the Sabco Folts Lease is necessary if Sabco is to recover these reserves. The parties agree further that there is no regular location on the Sabco Folts Lease where such a well might be drilled. A location 467 feet from the west line and 467 feet from the south line of the Sabco Folts Lease would not be productive in the La Belle, SW (6500) Sand. Such a location would be downthrown to the boundary fault on the north or faulted out.

According to reserve estimates of Sabco's reservoir engineer, oil in place beneath the Sabco Folts Lease is 51,000 BO. Current recoverable oil beneath this lease is 33,366 BO. Gas in place beneath the lease is 5,427 MCF, and current recoverable gas is 3,528 MCF. Square Mile did not directly dispute Sabco's estimate of current recoverable oil beneath the Sabco Folts Lease by presenting its own estimate, but did question Sabco's assumption of a 65% recovery factor. Still, Square Mile postulated that Sabco had simply underestimated original oil in place, which could account for a comparable amount of current recoverable reserves, even if Sabco's 65% recovery factor is inflated. Sabco is entitled to an opportunity to recover the current recoverable hydrocarbons beneath the Folts Lease, and any denial of this opportunity to Sabco would amount to confiscation.

A well is also needed on the Sabco Folts Lease to protect the lease against drainage by the Catfish #1. Sabco's reservoir engineer estimated that the Catfish #1 has drained about 6,000 BO from the Sabco Folts Lease.

The only point of controversy between Sabco and Square Mile concerns the reasonableness of Sabco's proposed location for the Sabco Folts #5. Square Mile contends that there is an alternative location on the Sabco Folts Lease for the Sabco Folts #5 that is more reasonable than the proposed location in that it is less irregular to Square Mile's lease line and still structurally equivalent to Sabco's proposed location. This contention rises or falls depending upon the accuracy of the structure map prepared by Square Mile's geologist from seismic data and well logs after receiving the log for the Sabco Folts #4 the week before the hearing. Square Mile believes that there is a secondary high in the La Belle, SW (6500) Sand structure 467 feet to the east of Square Mile's lease line where the Sabco Folts #5 would encounter the 6500' Sand at about -6510', which Square Mile believes is the same elevation where the well would encounter the top of the sand if drilled at Sabco's proposed location.

The examiners have concluded that Sabco's proposed location for the Sabco Folts #5 is the more reasonable location because Square Mile's geologist did not convincingly establish that the secondary high in the La Belle, SW (6500) Sand structure mapped by Square Mile 467 feet to the east of Square Mile's lease line actually exists. Square Mile's interpretation of the seismic data as support for this secondary high is doubtful. In fact, prior to the time when Square Mile's geologist was provided the log for the Sabco Folts #4 which encountered the top of the 6500' Sand at -6510' only about 200 feet from where Sabco proposes to drill the Sabco Folts #5, a prior structure map prepared by Square Mile's geologist had mapped a large portion of the Sabco Folts Lease significantly high to the Catfish #1 which encountered the 6500' Sand at -6493'. All are now agreed that this was inaccurate.

Sabco's interpretation of a structural high where the Sabco Folts #5 is proposed to be drilled is supported by nearby well control consisting of the Catfish #1 and the Folts #4. In contrast, there is no well control in the immediate vicinity of Square Mile's suggested alternative location. Square Mile's position that the alternative location is structurally equivalent to Sabco's proposed location is supported only by Square Mile's hotly disputed geological interpretation of seismic data and comparatively remote well control.

Sabco's structure map does not show the secondary high at the 467 foot location contended for by Square Mile, and Sabco's geologist and geophysicist testified that no such secondary high exists. According to the Sabco structure map, the alternative location recommended by Square Mile is considerably down dip from Sabco's proposed location and relatively near the oil-water contact seen in the log of the Sabco Folts #4. On Sabco's structure map, Square Mile's alternative location falls somewhere between the -6520' and -6530' contours. Square Mile's description of the reservoir structure is in some cases equivocal. For example, referring to Sabco's Exhibit No. 31 C to C' east-west trending seismic line, which Sabco's geophysicist said did not show the secondary high mapped by Square Mile, Square Mile's geologist testified that as the line extends from the Square Mile lease line and Sabco's proposed location for the Sabco Folts #5 to Square Mile's recommended 467'

location, there are about two milliseconds of dip or loss in structure, or about 8 feet, “but you could argue it is flat.”

The Square Mile structure map is heavily influenced by the Sun Oil Company Folts #1 well on the east side of the map, 3,138 feet from the west line of the Folts Lease. According to Square Mile, this well is downthrown to the trapping fault, and Square Mile’s geologist testified that the fault is dying out and is very small in the area of this well, although still present. Square Mile’s geologist testified that if a 15-foot throw is assumed, the upthrown point south of the Folts #1 has to be around -6520'. This caused Square Mile to terminate the -6520' contour on its structure map in the area of the Sun Oil Company, Folts #1. This stretched the reservoir out to the east, made the reservoir appear larger, and created the opportunity for Square Mile to interpret a secondary high on the Sabco Folts Lease in the area of Square Mile’s recommended 467 foot location for the Sabco Folts #5.

The examiners are not persuaded of the soundness of Square Mile’s theory as to why the reservoir should be stretched out to the east and a -6520' contour should be terminated against the fault in the area of the Folts #1. Square Mile’s Exhibit No. 8 structure map shows the top of the sand in the Sun Oil Company Folts #1 is at -6535' as contrasted with Sabco’s more reliable pick of -6540' from the log for the Folts #1. Both parties believe that the trapping fault dies out on the eastern side of the reservoir. No fault cut or missing section is seen in the Sun Oil Company Folts #1 log which is included in Sabco Exhibit No. 38. Square Mile’s geologist purported to have interpreted a fault cut in a deeper section of the log, but did not present this log section at the hearing. Failure to produce this log section is significant given the importance to Square Mile’s structural interpretation of the extension of the fault to the east through the Folts #1 location. Seismic lines presented by Sabco’s geophysicist tend to show that the fault does not extend as far as the Folts No. 1 location. Without the fault extended out this far, the structural contours should accurately depict the 6500' Sand top at -6540' in the area south of the Sun Oil Company Folts #1. A structure map modified to show the correct top in the area south of the Sun Oil Company Folts #1 would not allow for a secondary high on the Sabco Folts Lease, and would show the more likely dip from the Sabco Folts #4 location at -6510' down to -6540' in the area south of the Sun Oil Company Folts #1 location.

The reservoir is a three way dip structure trapped against a down to the north fault. The Sabco Folts Lease acreage position is on the eastern flank of the main structural feature, a south dipping structure. Sabco’s Exhibit No. 31 C to C' seismic line shows consistent dip from the crest of the reservoir at the Square Mile Catfish #1, past the Sabco Folts #4 location, and continuing down to the east and southeast. The data does not support a secondary reservoir high on the Sabco Folts Lease.

The examiners have concluded that the most persuasive evidence of the La Belle, SW (6500) Sand structure is the recent log data for the Sabco Folts #4. This log data caused both Sabco and Square Mile to make significant changes to their previous structural interpretations. Prior to drilling the Sabco Folts #4, Sabco had a structural interpretation of the reservoir indicating that Sabco could encounter the 6500' sand at a -6500' elevation as far as 467 feet east of the Square Mile lease line. However, the drilling of the Sabco Folts #4 revealed that the reservoir top was actually at -6510' at

a location just 33 feet east of Square Mile's lease line. The Sabco Folts #4 came in a full 10 feet structurally low to the elevation that Sabco had projected. This well proves that the top of the 6500' Sand to the east of the Catfish #1 well is low to the Catfish #1 by a full 15 feet, and this information is properly incorporated into Sabco's structure map.

The examiners believe that Sabco has proven that its proposed location for the Sabco Folts #5 is reasonable because the location is high on structure, and structure is important in making a producing well in this reservoir. This sand is a strong water drive sand with hydrocarbons trapped at the higher structural elevations. The higher a well encounters the structure, the more reserves the well will recover. Sabco needs to drill at the highest structural position on the Sabco Folts Lease in order to recover the reserves beneath the lease before water encroaches on the well. Drilling the well at the alternative location suggested by Square Mile would run a significant risk of encountering the 6500' reservoir at a down dip location and cause the well to experience the same water coning problems that plagued the Catfish #1.

The proposed location is reasonable even though it is only 33 feet from Square Mile's lease line. Positioning the well at this location is necessary to place the well high on structure and recover the current recoverable reserves beneath the Sabco Folts Lease. Square Mile's Catfish #1 will still have a structural advantage over the Sabco Folts #5. Sabco projects that the Sabco Folts #5 will encounter the top of the 6500' Sand at about -6505', which will be low to the Square Mile Catfish #1 by 10 to 12 feet.

The examiners recommend that Sabco be granted a Rule 37 exception for the Sabco Folts Lease, Well No. 5, in the La Belle, SW (6500) Field, Jefferson County, Texas. The examiners conclude that Sabco did not present evidence sufficient to justify the granting of a Rule 37 exception in the Wildcat Field.

Based on the record in this case, the examiners recommend adoption of the following Findings of Fact and Conclusions of Law.

FINDINGS OF FACT

1. At least ten (10) days notice of this hearing was provided to all affected persons as defined by Statewide Rule 37(a)(2) and 37(a)(3).
2. Sabco Operating Company ("Sabco") requests a Rule 37 exception permit for its Sabco Folts Lease, Well No. 5, La Belle, SW (6500) and Wildcat Fields, Jefferson County, Texas. The well is proposed to be drilled as a vertical well on the western edge of Sabco's 116-acre Folts Lease and will be the first well on the Folts Lease to be completed in the La Belle, SW (6500) Field.

3. The location of the proposed well is 33 feet from the west line and 400 feet from the south line of the Sabco Folts Lease and 1393 feet from the west line and 400 feet from the south line of the EL&RR RR Co./Spalding, C Survey, A-695, Jefferson County, Texas.
4. Field rules for the La Belle, SW (6500) and Wildcat Fields provide for 467 foot lease line spacing. A Rule 37 exception is required for the Sabco Folts Lease, Well No. 5 because the surface location of the well is 33 feet from the west line of the lease.
5. The application is opposed by Square Mile Energy, L.L.C. ("Square Mile") which is the operator of the Catfish Lease which offsets the Sabco Folts Lease to the west.
6. The La Belle, SW (6500) Field is currently a one well field. The only well in the field is the Catfish #1 operated by Square Mile.
7. The La Belle, SW (6500) Field is a strong water drive reservoir. The original oil-water contact was at -6530'. Sabco's interpretation is that the oil-water contact had moved up to -6528' as of August 2011, when the Sabco Folts #4 well was logged.
8. Wells must be drilled high on structure in this reservoir in order to maximize the recovery of reserves. The reservoir has a strong water drive and hydrocarbons are trapped at the higher structural elevations.
9. The Square Mile Catfish #1 well is completed at the crest of the La Belle, SW (6500) sand structure. This well encountered the top of the 6500' Sand at about -6493' to -6495'.
10. The reservoir is a three way dip structure trapped against a down to the north fault. The Sabco Folts Lease acreage is on the eastern flank of the main structural feature, a south dipping structure. There is no location on the Sabco Folts Lease which is as high structurally as the location of the Square Mile Catfish #1 well.
11. According to Sabco's reserve estimates, oil in place beneath the Sabco Folts Lease is 51,000 BO. Current recoverable oil beneath this lease is 33,366 BO. Gas in place beneath the lease is 5,427 MCF, and current recoverable gas is 3,528 MCF. Square Mile did not provide any contrary estimates of the amount of oil or gas in place or currently recoverable oil or gas beneath the Sabco Folts Lease.
12. The Square Mile Catfish #1 well is draining hydrocarbons from beneath the Sabco Folts Lease.
13. There is no regular location on the Sabco Folts Lease where the proposed Sabco Folts #5 well might be drilled to encounter the target reservoir. A location 467 feet from the west line and 467 feet from the south line of the lease would not be productive in the La Belle, SW (6500) Sand. Such a location would be downthrown to the boundary fault on the north or faulted out.

14. Square Mile agrees with Sabco that there are recoverable reserves in the La Belle, SW (6500) Field beneath the Sabco Folts Lease, there is no regular location on the Sabco Folts Lease that will provide Sabco an opportunity to recover these reserves, and drilling of a well high on structure is necessary to maximize recovery of reserves in this reservoir. The only point of contention between Sabco and Square Mile is the reasonableness of Sabco's proposed location.
15. In August 2011, Sabco drilled the Sabco Folts #4 well. This well was drilled vertically through the La Belle, SW (6500) interval, then cased and drilled directionally to the Marg interval where the well is now producing. This well encountered the La Belle, SW (6500) Sand at a depth of -6510'. The point at which the Sabco Folts #4 encountered the La Belle, SW (6500) Sand is about 200 feet from the proposed location of the Sabco Folts #5.
16. The drilling of the Sabco Folts #4 provided Sabco and Square Mile with information they did not previously have regarding the La Belle, SW (6500) Sand structure beneath the Sabco Folts Lease. Prior to the drilling of the Sabco Folts #4, Sabco believed that the reservoir extended further to the east on the Sabco Folts Lease, providing a location for the Sabco Folts #5 only slightly down dip to the Catfish #1. Square Mile had prepared a structure map of the reservoir which mapped a large portion of the Sabco Folts Lease significantly high to the Catfish #1 well. These prior interpretations were proved incorrect by the drilling of the Sabco Folts #4.
17. Drilling of the Sabco Folts #4 revealed that the reservoir top was actually at -6510' at a location just 33 feet east of Square Mile's lease line. The Sabco Folts #4 came in a full 10 feet structurally low to the elevation that Sabco had projected.
18. Sabco's proposed location for the Sabco Folts #5 is reasonable.
 - a. Sabco's proposed location for the Sabco Folts #5 is at the highest structural position on the Sabco Folts Lease. This location is slightly up dip from the point at which the Sabco Folts #4 encountered the top of the La Belle, SW (6500) Sand. Sabco projects that the Sabco Folts #5 will encounter the top of the La Belle, SW (6500) Sand at about -6505'.
 - b. Drilling the Sabco Folts #5 at the location proposed by Sabco will extend the economic life of the well and maximize recovery of reserves from beneath the Sabco Folts Lease.
 - c. Moving the proposed location of the Sabco Folts #5 east on the Sabco Folts Lease to a location less irregular to Square Mile's lease line would be moving down dip to a structurally lower position.
 - d. Sabco's position that it's proposed location for the Sabco Folts #5 is at a structurally high position on the Folts Lease is supported by nearby well control consisting of the Catfish #1 and the Folts #4.

- e. Square Mile's interpretation that there is a secondary high on the Sabco Folts Lease and a location 467' east of Square Mile's lease line where the Sabco Folts #5 would encounter the top of the La Belle, SW (6500) Sand at -6510' is not supported by any nearby well control.
 - f. The available seismic data is subject to differing and sometimes speculative geological interpretations. The seismic data as a whole does not indisputably establish that there is an alternative location 467 feet east of Square Mile's lease line that is structurally equivalent to Sabco's proposed location.
 - g. Coning of water is a problem in this reservoir. The initial perforations in the Catfish #1 were ten feet above the oil-water contact, but by the time these perforations were abandoned in October 2011, the well was making 1,000 barrels of water per day due to coning. Moving the proposed Sabco Folts #5 to the east on the Sabco Folts Lease would be moving to a down dip location near the oil-water contact and the lesser oil column in such a well would risk the coning of water which would shorten the economic life of the well.
 - g. Although Sabco's proposed location is 33 feet from Square Mile's lease line, Square Mile's Catfish #1 will still have a structural advantage over the Sabco Folts #5. Sabco projects that the Sabco Folts #5 will encounter the top of the 6500' Sand at about -6505', which will be low to the Square Mile Catfish #1 by 10 to 12 feet.
18. Sabco did not identify any wildcat zone above the proposed total depth of the Sabco Folts #5. All of Sabco's geologic evidence related to the La Belle, SW (6500) Field.

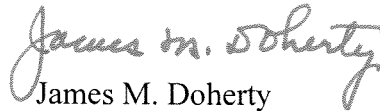
CONCLUSIONS OF LAW

- 1. Proper notice of hearing was timely issued by the Railroad Commission to appropriate persons legally entitled to notice.
- 2. All things necessary to the Commission attaining jurisdiction over the subject matter and the parties in this hearing have been performed.
- 3. Approval of a Rule 37 exception for the Sabco Folts Lease, Well No. 5, La Belle, SW (6500) Field, Jefferson County, Texas, is necessary to prevent confiscation and protect the correlative rights of mineral owners.
- 4. Sabco Operating Company did not prove that approval of a Rule 37 exception for the Sabco Folts Lease, Well No. 5 in the Wildcat Field is necessary to prevent waste or protect correlative rights of mineral owners.

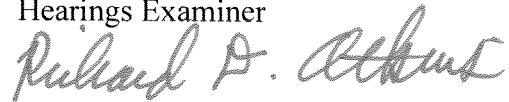
RECOMMENDATION

The examiners recommend that the application of Sabco Operating Company for a Rule 37 exception for the Sabco Folts Lease, Well No. 5 in the La Belle, SW (6500) Field, Jefferson County, Texas, be granted as necessary to prevent confiscation and protect correlative rights and otherwise that the application be denied.

Respectfully submitted,



James M. Doherty
Hearings Examiner



Richard Atkins
Technical Examiner